

05-22-00

A

Practitioner's Docket No. 460-009420-US(PAR)

PATENT

Preliminary Classification:

Proposed Class:

Subclass:

NOTE: "All applicants are requested to include a preliminary classification on newly filed patent applications. The preliminary classification, preferably class and subclass designations, should be identified in the upper right-hand corner of the letter of transmittal accompanying the application papers, for example 'Proposed Class 2, subclass 129.'" M.P.E.P. § 601, 7th ed.

 Jc834 U.S. PTO
 05/19/00
 09/575342

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Box Patent Application
 Assistant Commissioner for Patents
 Washington, D.C. 20231

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of

Inventor(s): Jouni RAPAKKO, Sami PAJUSAARI

WARNING: 37 C.F.R. § 1.41(a)(1) points out:

"(a) A patent is applied for in the name or names of the actual inventor or inventors.

"(1) The inventorship of a nonprovisional application is that inventorship set forth in the oath or declaration as prescribed by § 1.63, except as provided for in § 1.53(d)(4) and § 1.63(d). If an oath or declaration as prescribed by § 1.63 is not filed during the pendency of a nonprovisional application, the inventorship is that inventorship set forth in the application papers filed pursuant to § 1.53(b), unless a petition under this paragraph accompanied by the fee set forth in § 1.17(i) is filed supplying or changing the name or names of the inventor or inventors."

For (title): METHOD FOR LOADING USER INTERFACE SOFTWARE

CERTIFICATION UNDER 37 C.F.R. § 1.10*
 (Express Mail label number is mandatory.)
 (Express Mail certification is optional.)

I hereby certify that this New Application Transmittal and the documents referred to as attached therein are being deposited with the United States Postal Service on this date _____, in an envelope as "Express Mail Post Office to Addressee," mailing Label Number EL336864077US, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

(type or print name of person mailing paper)

Delia G. Conrad
 Signature of person mailing paper

WARNING: Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. § 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

***WARNING:** Each paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. § 1.10(b).

"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

(New Application Transmittal [4-1]—page 1 of 11)

 Jc834 U.S. PTO
 05/19/00

09575342 054933

1. Type of Application

This new application is for a(n)

(check one applicable item below)

- ☒ Original (nonprovisional)
☐ Design
☐ Plant

WARNING: Do not use this transmittal for a completion in the U.S. of an International Application under 35 U.S.C. § 371(c)(4), unless the International Application is being filed as a divisional, continuation or continuation-in-part application.

WARNING: Do not use this transmittal for the filing of a provisional application.

NOTE: If one of the following 3 items apply, then complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF A PRIOR U.S. APPLICATION CLAIMED and a NOTIFICATION IN PARENT APPLICATION OF THE FILING OF THIS CONTINUATION APPLICATION.

- ☐ Divisional.
☐ Continuation.
☐ Continuation-in-part (C-I-P).

2. Benefit of Prior U.S. Application(s) (35 U.S.C. §§ 119(e), 120, or 121)

NOTE: A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or copending international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or copending international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. § 112. Each prior application must also be:

(i) An international application entitled to a filing date in accordance with PCT Article 11 and designating the United States of America; or

(ii) Complete as set forth in § 1.51(b); or

(iii) Entitled to a filing date as set forth in § 1.53(b) or § 1.53(d) and include the basic filing fee set forth in § 1.16; or

(iv) Entitled to a filing date as set forth in § 1.53(b) and have paid therein the processing and retention fee set forth in § 1.21(f) within the time period set forth in § 1.53(f).

37 C.F.R. § 1.78(a)(1).

NOTE: If the new application being transmitted is a divisional, continuation or a continuation-in-part of a parent case, or where the parent case is an International Application which designated the U.S., or benefit of a prior provisional application is claimed, then check the following item and complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

WARNING: If an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. §§ 120, 121 or 365(c), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. §§ 120, 121 or 365(c). (35 U.S.C. § 154(a)(2) does not take into account, for the determination of the patent term, any application on which priority is claimed under 35 U.S.C. §§ 119, 365(a) or 365(b).) For a c-i-p application, applicant should review whether any claim in the patent that will issue is supported by an earlier application and, if not, the applicant should consider canceling the reference to the earlier filed application. The term of a patent is not based on a claim-by-claim approach. See Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,205.

WARNING: When the last day of pendency of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, any nonprovisional application claiming benefit of the provisional application must be filed prior to the Saturday, Sunday, or Federal holiday within the District of Columbia. See 37 C.F.R. § 1.78(a)(3).

- ☐ The new application being transmitted claims the benefit of prior U.S. application(s). Enclosed are ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

3. Papers Enclosed

A. Required for filing date under 37 C.F.R. § 1.53(b) (Regular) or 37 C.F.R. § 1.153 (Design) Application

19 Pages of specification

4 Pages of claims

3 Sheets of drawing

WARNING: DO NOT submit original drawings. A high quality copy of the drawings should be supplied when filing a patent application. The drawings that are submitted to the Office must be on strong, white, smooth, and non-shiny paper and meet the standards according to § 1.84. If corrections to the drawings are necessary, they should be made to the original drawing and a high-quality copy of the corrected original drawing then submitted to the Office. Only one copy is required or desired. For comments on proposed then-new 37 C.F.R. § 1.84, see Notice of March 9, 1988 (1990 O.G. 57-62).

NOTE: "Identifying indicia, if provided, should include the application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application. This information should be placed on the back of each sheet of drawing a minimum distance of 1.5 cm. (5/8 inch) down from the top of the page . . ." 37 C.F.R. § 1.84(c)).

(complete the following, if applicable)

- ☐ The enclosed drawing(s) are photograph(s), and there is also attached a "PETITION TO ACCEPT PHOTOGRAPH(S) AS DRAWING(S)." 37 C.F.R. § 1.84(b).
- ☐ formal
- ☐ informal

B. Other Papers Enclosed

6 Pages of declaration and power of attorney

1 Pages of abstract

 Other

4. Additional papers enclosed

- ☐ Amendment to claims
- ☐ Cancel in this applications claims _____ before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)
- ☐ Add the claims shown on the attached amendment. (Claims added have been numbered consecutively following the highest numbered original claims.)
- ☒ Preliminary Amendment
- ☒ Information Disclosure Statement (37 C.F.R. § 1.98)
- ☒ Form PTO-1449 (PTO/SB/08A and 08B)
- ☒ Citations

(New Application Transmittal [4-1]—page 3 of 11)

- ☐ Declaration of Biological Deposit
- ☐ Submission of "Sequence Listing," computer readable copy and/or amendment pertaining thereto for biotechnology invention containing nucleotide and/or amino acid sequence.
- ☐ Authorization of Attorney(s) to Accept and Follow Instructions from Representative
- ☐ Special Comments
- ☐ Other

5. Declaration or oath (including power of attorney)

NOTE: A newly executed declaration is not required in a continuation or divisional application provided that the prior nonprovisional application contained a declaration as required, the application being filed is by all or fewer than all the inventors named in the prior application, there is no new matter in the application being filed, and a copy of the executed declaration filed in the prior application (showing the signature or an indication thereon that it was signed) is submitted. The copy must be accompanied by a statement requesting deletion of the names of person(s) who are not inventors of the application being filed. If the declaration in the prior application was filed under § 1.47, then a copy of that declaration must be filed accompanied by a copy of the decision granting § 1.47 status or, if a nonsigning person under § 1.47 has subsequently joined in a prior application, then a copy of the subsequently executed declaration must be filed. See 37 C.F.R. §§ 1.63(d)(1)–(3).

NOTE: A declaration filed to complete an application must be executed, identify the specification to which it is directed, identify each inventor by full name including family name and at least one given name, without abbreviation together with any other given name or initial, and the residence, post office address and country or citizenship of each inventor, and state whether the inventor is a sole or joint inventor. 37 C.F.R. § 1.63(a)(1)–(4).

☒ Enclosed

Executed by

(check all applicable boxes)

☒ inventor(s).

☐ legal representative of inventor(s).
37 C.F.R. §§ 1.42 or 1.43.

☐ joint inventor or person showing a proprietary interest on behalf of inventor who refused to sign or cannot be reached.

☐ This is the petition required by 37 C.F.R. § 1.47 and the statement required by 37 C.F.R. § 1.47 is also attached. See item 13 below for fee.

☐ Not Enclosed.

NOTE: Where the filing is a completion in the U.S. of an International Application or where the completion of the U.S. application contains subject matter in addition to the International Application, the application may be treated as a continuation or continuation-in-part, as the case may be, utilizing ADDED PAGE FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION CLAIMED.

☐ Application is made by a person authorized under 37 C.F.R. § 1.41(c) on behalf of all the above named inventor(s).

(The declaration or oath, along with the surcharge required by 37 C.F.R. § 1.16(e) can be filed subsequently).

☐ Showing that the filing is authorized.
(not required unless called into question. 37 C.F.R. § 1.41(d))

(New Application Transmittal [4-1]—page 4 of 11)

6. Inventorship Statement

WARNING: If the named inventors are each not the inventors of all the claims an explanation, including the ownership of the various claims at the time the last claimed invention was made, should be submitted.

The inventorship for all the claims in this application are:

☐ The same.

or

☐ Not the same. An explanation, including the ownership of the various claims at the time the last claimed invention was made,

☐ is submitted.

☐ will be submitted.

7. Language

NOTE: An application including a signed oath or declaration may be filed in a language other than English. An English translation of the non-English language application and the processing fee of \$130.00 required by 37 C.F.R. § 1.17(k) is required to be filed with the application, or within such time as may be set by the Office. 37 C.F.R. § 1.52(d).

☒ English

☐ Non-English

☐ The attached translation includes a statement that the translation is accurate. 37 C.F.R. § 1.52(d).

8. Assignment

☒ An assignment of the invention to Nokia Mobile Phones Ltd.

☒ is attached. A separate ☒ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

☐ will follow.

NOTE: "If an assignment is submitted with a new application, send two separate letters—one for the application and one for the assignment." Notice of May 4, 1990 (1114 O.G. 77-78).

WARNING: A newly executed "CERTIFICATE UNDER 37 C.F.R. § 3.73(b)" must be filed when a continuation-in-part application is filed by an assignee. Notice of April 30, 1993, 1150 O.G. 62-64.

(New Application Transmittal [4-1]—page 5 of 11)

9. Certified Copy

Certified copy(ies) of application(s)

Country	Appln. No.	Filed
Finland	991167	24 May 1999
Country	Appln. No.	Filed
Country	Appln. No.	Filed

from which priority is claimed

☒ is (are) attached.

☐ will follow.

NOTE: The foreign application forming the basis for the claim for priority must be referred to in the oath or declaration. 37 C.F.R. § 1.55(a) and 1.63.

NOTE: This item is for any foreign priority for which the application being filed directly relates. If any parent U.S. application or International Application from which this application claims benefit under 35 U.S.C. § 120 is itself entitled to priority from a prior foreign application, then complete item 18 on the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

10. Fee Calculation (37 C.F.R. § 1.16)

A. ☒ Regular application

CLAIMS AS FILED						
Number filed		Number Extra		Rate	Basic Fee 37 C.F.R. § 1.16(a) \$ 690.00	
Total						
Claims (37 C.F.R. § 1.16(c))	14	- 20 =	0	×	\$ 18.00	0
Independent						
Claims (37 C.F.R. § 1.16(b))	3	- 3 =	0	×	\$ 78.00	0
Multiple dependent claim(s), if any (37 C.F.R. § 1.16(d))				+	\$260.00	

☐ Amendment cancelling extra claims is enclosed.

☒ Amendment deleting multiple-dependencies is enclosed.

☐ Fee for extra claims is not being paid at this time.

NOTE: If the fees for extra claims are not paid on filing they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Patent and Trademark Office in any notice of fee deficiency. 37 C.F.R. § 1.16(d).

Filing Fee Calculation

\$ 690.00

B. ☐ Design application
(\$310.00—37 C.F.R. § 1.16(f))

Filing Fee Calculation

\$

C. ☐ Plant application
(\$480.00—37 C.F.R. § 1.16(g))

Filing fee calculation

\$

11. Small Entity Statement(s)

- ☐ Statement(s) that this is a filing by a small entity under 37 C.F.R. § 1.9 and 1.27 is (are) attached.

WARNING: "Status as a small entity must be specifically established in each application or patent in which the status is available and desired. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. The refiling of an application under § 1.53 as a continuation, division, or continuation-in-part (including a continued prosecution application under § 1.53(d)), or the filing of a reissue application requires a new determination as to continued entitlement to small entity status for the continuing or reissue application. A nonprovisional application claiming benefit under 35 U.S.C. § 119(e), 120, 121, or 365(c) of a prior application, or a reissue application may rely on a statement filed in the prior application or in the patent if the nonprovisional application or the reissue application includes a reference to the statement in the prior application or in the patent or includes a copy of the statement in the prior application or in the patent and status as a small entity is still proper and desired. The payment of the small entity basic statutory filing fee will be treated as such a reference for purposes of this section." 37 C.F.R. § 1.28(a)(2).

WARNING: "Small entity status must not be established when the person or persons signing the . . . statement can unequivocally make the required self-certification." M.P.E.P., § 509.03, 6th ed., rev. 2, July 1996 (emphasis added).

(complete the following, if applicable)

- ☐ Status as a small entity was claimed in prior application
_____ / _____, filed on _____, from which benefit
is being claimed for this application under:

35 U.S.C. § ☐ 119(e),
☐ 120,
☐ 121,
☐ 365(c),

and which status as a small entity is still proper and desired.

- ☐ A copy of the statement in the prior application is included.

Filing Fee Calculation (50% of A, B or C above)

\$ _____

NOTE: Any excess of the full fee paid will be refunded if small entity status is established and a refund request are filed within 2 months of the date of timely payment of a full fee. The two-month period is not extendable under § 1.136. 37 C.F.R. § 1.28(a).

12. Request for International-Type Search (37 C.F.R. § 1.104(d))

(complete, if applicable)

- ☐ Please prepare an international-type search report for this application at the time when national examination on the merits takes place.

13. Fee Payment Being Made at This Time

☐ Not Enclosed

☐ No filing fee is to be paid at this time.

(This and the surcharge required by 37 C.F.R. § 1.16(e) can be paid subsequently.)

☒ Enclosed

☒ Filing fee \$ 690.00

☒ Recording assignment
(\$40.00; 37 C.F.R. § 1.21(h))
(See attached "COVER SHEET FOR
ASSIGNMENT ACCOMPANYING NEW
APPLICATION".) \$ 40.00

☐ Petition fee for filing by other than all the
inventors or person on behalf of the inventor
where inventor refused to sign or cannot be
reached
(\$130.00; 37 C.F.R. §§ 1.47 and 1.17(i)) \$ _____

☐ For processing an application with a
specification in
a non-English language
(\$130.00; 37 C.F.R. §§ 1.52(d) and 1.17(k)) \$ _____

☐ Processing and retention fee
(\$130.00; 37 C.F.R. §§ 1.53(d) and 1.21(l)) \$ _____

☐ Fee for international-type search report
(\$40.00; 37 C.F.R. § 1.21(e)) \$ _____

NOTE: 37 C.F.R. § 1.21(f) establishes a fee for processing and retaining any application that is abandoned for failing to complete the application pursuant to 37 C.F.R. § 1.53(f) and this, as well as the changes to 37 C.F.R. §§ 1.53 and 1.78(a)(1), indicate that in order to obtain the benefit of a prior U.S. application, either the basic filing fee must be paid, or the processing and retention fee of § 1.21(f) must be paid, within 1 year from notification under § 53(f).

Total fees enclosed \$ 730.00

14. Method of Payment of Fees

☒ Check in the amount of \$ 730.00

☐ Charge Account No. _____ in the amount of
\$ _____

A duplicate of this transmittal is attached.

NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37 C.F.R. § 1.22(b).

15. Authorization to Charge Additional Fees

WARNING: If no fees are to be paid on filing, the following items should not be completed.

WARNING: Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges, if extra claim charges are authorized.

- ☒ The Commissioner is hereby authorized to charge the following additional fees by this paper and during the entire pendency of this application to Account No. 16-1350:

☒ 37 C.F.R. § 1.16(a), (f) or (g) (filing fees)

☒ 37 C.F.R. § 1.16(b), (c) and (d) (presentation of extra claims)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.16(d)), it might be best not to authorize the PTO to charge additional claim fees, except possibly when dealing with amendments after final action.

☒ 37 C.F.R. § 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

☒ 37 C.F.R. § 1.17(a)(1)–(5) (extension fees pursuant to § 1.136(a)).

☐ 37 C.F.R. § 1.17 (application processing fees)

NOTE: ". . . A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).

☐ 37 C.F.R. § 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. § 1.311(b))

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 C.F.R. § 1.311(b).

NOTE: 37 C.F.R. § 1.28(b) requires "Notification of any change in status resulting in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying, . . . the issue fee. . . ." From the wording of 37 C.F.R. § 1.28(b), (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

(New Application Transmittal [4-1]—page 9 of 11)

16. Instructions as to Overpayment

NOTE: "... Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

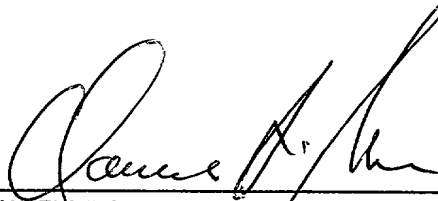
- ☒ Credit Account No. 16-1350
☐ Refund

SEND ALL CORRESPONDENCE TO:

Reg. No. 24,622

Tel. No. (203) 259-1800

Customer No.



SIGNATURE OF PRACTITIONER

Clarence A. Green

(type or print name of attorney)

PERMAN & GREEN, LLP

P.O. Address

425 Post Road, Fairfield, Connecticut 06430

☐ **Incorporation by reference of added pages**

(check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED)

- ☐ Plus Added Pages for New Application Transmittal Where Benefit of Prior U.S. Application(s) Claimed

Number of pages added _____

- ☐ Plus Added Pages for Papers Referred to in Item 4 Above

Number of pages added _____

- ☐ Plus added pages deleting names of inventor(s) named in prior application(s) who is/are no longer inventor(s) of the subject matter claimed in this application.

Number of pages added _____

- ☐ Plus "Assignment Cover Letter Accompanying New Application"

Number of pages added _____

☒ **Statement Where No Further Pages Added**

(if no further pages form a part of this Transmittal, then end this Transmittal with this page and check the following item)

- ☒ This transmittal ends with this page.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Express Mail No.: EL336864077US

In re Application of: RAPAKKO et al.

SERIAL NUMBER: EXAMINER:

FILING DATE: Herewith ART UNIT:

TITLE: METHOD FOR LOADING USER INTERFACE SOFTWARE

ATTORNEY DOCKET NO.: 460-009420-US(PAR)

The Commissioner of Patents and Trademarks

Washington, D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Please amend the above-identified, enclosed patent application as follows:

IN THE CLAIMS:

Please amend Claims 5, 12 and 13 as shown below.

Claim 5, line 1, delete “any of the claims 1 to 4” and insert --claim 1--.

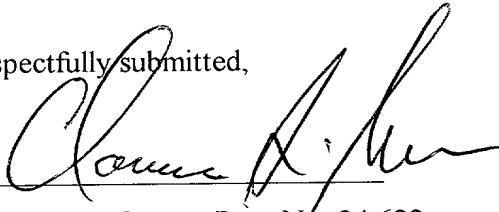
Claim 12, line 1, delete “any of the claims 7 to 11” and insert --claim 7--.

Claim 13, line 1, delete “any of the claims 7 to 11” and insert --claim 7--.

REMARKS

Please enter this preliminary amendment prior to calculation of the fees.

Respectfully submitted,



Clarence A. Green, Reg. No. 24,622

Perman & Green, LLP

425 Post Road

Fairfield, CT 06430

(203) 259-1800

19 May 2000
Date

Method for loading user interface software

The present invention relates to a method for loading user interface software of an expansion card in an electronic device, the method comprising means for loading, activating and executing program modules in an electronic device, which expansion card can be coupled in a releasable manner to the electronic device. The invention also relates to an electronic device which comprises means for loading user interface software in the electronic device, means for coupling an expansion card in a releasable manner in the electronic device and means for loading, activating and executing program modules in the electronic device. Moreover, the invention relates to a storage means for the user interface software and loading program of an expansion card in an electronic device, which expansion card can be coupled in a releasable manner to the electronic device.

The PCMCIA interface (Personal Computer Memory Card International Association) is a known interface which is used in connection with electronic devices to couple expansion cards, such as memory cards (e.g. FLASH memory cards), modems and different input/output cards (I/O) to an electronic device. Thus, the electronic device and the PCMCIA card are provided with connectors according to the PCMCIA standard in such a way that the connector of the electronic device is a so-called male connector, *i.e.* it is equipped with contact pins, and the connector of the card is a so-called female connector, *i.e.* it is equipped with contact sockets, wherein when the PCMCIA card is coupled to the PCMCIA connector of the electronic device, an electrical coupling is formed between each contact pin and corresponding contact socket. The PCMCIA standard determines the typical function of each contact pin and contact socket, respectively. Thus, for example in an application in which the PCMCIA interface is implemented in a computer, each data line of the data bus in the computer is coupled to a PCMCIA contact pin. Furthermore, at least some of the address and control lines are directed to the connector.

The PCMCIA cards have the size of a credit card (85.6 mm x 54 mm), but the thickness of the cards can be either 3.3 mm (Type I), 5.0 mm (Type II) or 10.5 mm (Type III). Electrically, the PCMCIA cards are

coupled to an electronic device in a 8/16 bit I/O interface or memory. A card according to the PCMCIA standard is equipped with a memory area which can be read by the electronic device and which contains information for identifying the card, *i.e.* a so-called card information structure (CIS).

Particularly in connection with portable data processors (Laptop PC), mobile station applications have been developed in which at least the transmitter/receiver unit of the wireless communication device is provided in a card format of the PCMCIA standard. The unit used for controlling the function of the card is advantageously a microcontroller (MCU) which is equipped with a processor, memory (RAM, ROM) and I/O lines for coupling the microprocessor to the electronics of the card. Furthermore, external memory may also be coupled in connection with the microcontroller.

The transmitter comprises for instance a modulator for modulation of the signal to be transmitted, filters for attenuation of spurious emissions in particular, a mixer in which the modulated signal is mixed with the local oscillator frequency in order to generate a radio frequency signal, and an output stage for amplification of the signal to be transmitted. The amplified signal is conveyed to an antenna, which is coupled to the card *e.g.* via a cable. The receiver comprises for instance filters for filtering the received signals, a mixer for converting the radio frequency signal to be received into an immediate frequency or, in a receiver of the direct conversion type, into the baseband, and a demodulator for demodulating the received signal.

To control the function of a card-like wireless communication device, so-called user interface software has been developed. By means of such user interface software it is possible to control the functions of a card-like wireless communication device from a data processor. By means of the software it is possible to control *e.g.* speech calls, transmission and reception of text messages, call diversion set-ups, etc. Moreover, by means of the user interface software the user can enter and edit possible access codes, such as a personal identification number (PIN), a personal unblocking key (PUK), or other security codes of the wireless communication device.

When a data processor is started, a so-called operating system, such as Windows®95, Windows®98, or Windows®NT by Microsoft, is activated. The purpose of the operating system is to control the function of the data processor. In connection with the loading of the operating system, so-called device drivers are also loaded in the program memory of the electronic device. The device driver is a set of program codes which are used to effect the operation of controlling the expansion cards, keyboard, display device, serial ports or corresponding elements that are coupled to the data processor. There are different types of device drivers for different purposes of use, which is prior art known as such by anyone skilled in the art, and thus requires no further discussion in this context.

In some operating systems of prior art, the user interface software can be loaded from the device driver, as for example in Windows®95 and Windows®98 operating systems. When the loading is effected from the device driver, the device driver is loaded for example when a card-like wireless communication device is coupled to the data processor, if the operating system of the data processor is provided with a so-called plug-and-play function. Thus an identification coupling arranged in the expansion card interface indicates that the card-like wireless communication device is coupled to the data processor. After the identification, a control program of the expansion card interface is executed in the operating system for example to examine the CIS database of the card coupled to the interface. On the basis of the type of the card the operating system loads the corresponding device driver. After being started the device driver executes the loading of the user interface software in the memory of the data processor, whereafter the user interface software is started.

In every operating system of prior art, the user interface software cannot be loaded from the device driver. An example of such a operating system is Windows®NT. In that case the user interface software can be loaded in such a way, that the user of the data processor has for example at the installation stage of the user interface software determined the activation of this user interface software in the start-up settings of the operating system. In this alternative, the user interface software is thus always loaded in connection with the

activation of the operating system, or when the user logs in to the operating system. The loading is effected even though the card-like wireless communication device is not coupled to the data processor, and even though the user has no need to use the card-like wireless terminal. Thus, the memory capacity of the data processor is unnecessarily occupied. Furthermore, the amount of time passed in the loading of the operating system can be significantly increased, especially when the user interface software to be loaded is large in size.

In a user interface software of prior art, the shut down of the user interface software is implemented in a situation where a card-like wireless terminal is not connected to the data processor. Thus, memory capacity is released for other use. This solution does not, however, reduce the amount of time passed in the loading of the user interface software in connection with starting the operating system. Furthermore, this loading method has the drawback that the user interface software cannot be activated again automatically, if a card-like wireless terminal is connected to the data processor after starting the operating system, if the user interface software has already been shut down.

Thus, when solutions of prior art are used, one has to know in which way the start-up of the user interface software can be implemented in the operating system used at a given time. This complicates the installation of the software and may cause error situations. In addition, these different loading alternatives have to be taken into account in the manufacture of the user interface software, and thus different operating system types have to be provided with at least partly different versions of the operating software, which also complicates the development and maintenance of the program.

Another drawback of the solutions of prior art is that it is difficult to implement different language versions. If the device driver detects an error in connection with the start-up, the error messages have to be either in one language, or separate device drivers have to be produced for the different language versions. This feature also complicates the installation of the device drivers and increases the amount of work required for manufacture and maintenance. In practical applications it is

not, however, sensible to print the error messages from the device driver, because in several operating systems the entire system is halted until the user acknowledges the error message. On the other hand, in every operating system, such as Windows®NT and Windows®2000, it is not even possible to print the error messages from the device driver.

One purpose of the present invention is to produce a new method for automatic loading of the operating software of a card-like wireless communication device to a data processor, and an electronic device applying the method. The invention is based on the idea, that in connection with the electronic device, a loading program module is arranged, which module is provided with functions for effecting the loading of the user interface when a card-like wireless communication device is coupled to the electronic device, substantially irrespective of the operating system used at a time. The method according to the present invention is characterized in that the user interface software is divided at least into a basic module and a user interface module, that the loading of the user interface module is executed in at least two phases, wherein in the first phase, the loading and start-up of the basic module is conducted, and in the second phase the loading and start-up of the user interface module is conducted, and that the second phase is conducted when the expansion card is coupled to the electronic device. The electronic device according to the present invention is characterized in that the user interface software is divided at least into a basic module and a user interface module, that means for loading the user interface software comprise means for loading and starting the basic module and means for loading and starting the user interface module, and that the loading of the user interface module is arranged to be effected when an expansion card is coupled to the electronic device. Furthermore, the storing means according to the present invention is characterized in that the user interface software is divided at least into a basic module and a user interface module, and that the loading program comprises procedures for loading the user interface software in at least two phases, wherein in the first phase, the loading and start-up of the basic module is arranged to be conducted, in the second phase the loading and start-up of the user interface module is arranged to be conducted, and that the second phase is arranged to be conducted when an expansion card is coupled to the electronic device.

With the present invention, considerable advantages are achieved when compared with solutions of prior art. Because in the data processor according to the invention the entire user interface program is not loaded at once, the start-up of the operating system is significantly faster. Furthermore, the method is substantially independent of the operating system, and thus the installation is less complicated and the amount of work required for product development and maintenance is smaller than in methods of prior art. By means of the operating software according to the invention it is possible to implement different language versions with relatively small additional expenses. In the method according to the invention, it is also possible to implement the act of informing the user of the possible error situations in different languages in a sensible manner so that the operating system does not stop to wait for the acknowledgement of the error message.

In the following, the invention will be described in more detail with reference to the appended drawings, in which

Fig. 1 is a reduced block diagram showing a preferred expansion card and electronic device, in connection with which it is possible to apply the invention,

Fig. 2 is a reduced arrow diagram showing a method according to a preferred embodiment of the invention, and

Fig. 3 shows information transmission between an expansion card and an electronic device.

Fig. 1 is a reduced block diagram showing a preferred expansion card 1 in connection with which it is possible to apply the invention. The expansion card 1 comprises an expansion card interface 2b, by means of which the expansion card 1 can be coupled to an electronic device 3, such as a portable data processor. The electronic device 3 comprises a corresponding expansion card interface 2a, for example an interface according to the PCMCIA standard. Thus, the expansion card interface 2a of the electronic device advantageously comprises a male connector

(not shown), to which the expansion card 1 is coupled by means of an expansion card interface 2b of the expansion card, which interface advantageously comprises a female connector (not shown). Hereinbelow, the common term "expansion card interface" and the reference numeral 2 will be used for this expansion card interface 2a of the electronic device and the expansion card interface 2b of the expansion card. This expansion card interface 2 can also be other kind of interface than an interface according to the PCMCIA standard. The expansion card interface 2 advantageously comprises an address bus, a control bus and a data bus. The address bus typically consists of several address lines by means of which the electronic device 3 is capable of addressing the different functional parts of the expansion card 1. Correspondingly, by means of the control bus it is possible to transmit control information, *e.g.* interrupt requests and state changes from the expansion card 1 to the electronic device 3. Control information can also be transmitted from the electronic device 3 to the expansion card 1. In the data bus which is typically of parallel form, there are also several data lines, for example eight data lines, allocated for data transmission, wherein it is possible to transmit one 8-bit byte at a time between the expansion card 1 and the electronic device 3. All interface lines in the expansion card interface are not shown, but only those by means of which it is possible to illustrate the present invention.

The electronic device 3 is for example a device, such as a personal computer (PC) or a portable computer (laptop PC), which comprises data processing functions. The expansion card 1 is advantageously a card, such as a radio card, containing mobile phone functions, but it is obvious that the invention can be applied also in connection with other electronic devices 3 and expansion cards that can be connected thereto.

Of the expansion card 1, only such blocks are shown which are necessary for the function of the expansion card 1 and for the understanding of the invention. To control the function of the expansion card, a controller 4, advantageously a micro control unit MCU is used. The controller 4 is provided with a memory 5, such as read-only memory (ROM) for storing application programs or the like, and random access memory (RAM) *e.g.* for storing data during the use. At least part

of the memory 5 is advantageously non-volatile random access memory (NVRAM). The application programs can also be stored in such a non-volatile random access memory, wherein it is easier to change the application program versions. Also, a so-called FLASH memory is known, which is a kind of non-volatile random access memory.

The functional parts, such as serial interface blocks 9, 10 and a CIS database, which can be addressed via the extension bus by the extension card 1, are specified in different physical addresses in the interface area. The address area is for example 256 bytes, wherein it takes 8 address lines (A0...A7) to indicate the addresses of the interface areas. Via the expansion card interface 2, the reading of the CIS database of the expansion card 1 is executed advantageously in such a way that the controller 16 of the electronic device sets the address of the CIS database into the address bus of the interface bus 19 as well as the state of the read line (IORD) in the control bus of the interface bus 19 into the logical value corresponding to the read enable state, *e.g.* the logical 1 state. Thus, by the expansion card 2 the first value (byte/word) of the CIS database is transferred in the data bus of the expansion card interface 2. At a time, it is possible to read such a number of bits which corresponds to the width of the data bus, typically one byte *i.e.* 8 bits or two bytes *i.e.* one word.

The controller 4 of the expansion card transmits information to a digital signal processing unit 6 (DSP), by means of which it is possible to implement different signal processing procedures, such as filtering. Data transmission between the controller 4 of the expansion card and the digital signal processing unit 6 is advantageously conducted via a control and data block 7 (API). This control and data block is implemented advantageously with a dual port ram known as such. Thus, the controller 4 has separate address, control and data lines to the control and data block 7, and correspondingly, the digital signal processing unit 6 has separate address, control and data lines coupled to the control and data block 7. When the controller 4 writes data in the control and data block 7, the control and data block 7 transmits information thereof to the digital signal processing unit 6 which on the basis of this reads the written data. Corresponding procedures are

executed in the opposite direction when the digital signal processing unit 6 writes data in the control and data block 7, the controller 4 is notified thereof and it reads the written data.

- 5 In this preferred embodiment, the digital signal processing unit 6 comprises an asynchronous serial interface block 8 (ASIO) and a synchronous serial interface block 9 (SIO). By means of these it is possible to transmit information in serial format between the digital signal processing unit 6 and a peripheral circuit, in this case a bus adapter 10. This will be described in more detail hereinbelow.

15 The bus adapter 10 of the expansion card is advantageously implemented with an application specific integrated circuit (ASIC). This bus adapter 10 is connected with two serial buses 11, 12 to the digital signal processing unit 6 in order to transmit information. In this advantageous embodiment, the first serial bus 11 is a so-called fast asynchronous serial bus (ASIO), which is connected to the asynchronous serial interface block 8 of the digital signal processing unit 6. The second serial bus 12 is a so-called synchronous serial bus (PCMBUS), which is connected to the synchronous serial interface bus 9 of the digital signal processing unit 6. The bus adapter 10 comprises an asynchronous transmitter/receiver block 13 (UART, Universal Asynchronous Receiver Transmitter) for the first serial bus 11, and a synchronous transmitter/receiver block 14 (USRT, Universal Synchronous Receiver Transmitter) for the second serial bus 12. These transmitter/receiver blocks 13, 14 conduct serial/parallel conversions for the information to be transmitted between the expansion card interface 2 and the serial bus 11, 12. These serial/parallel conversions are necessary when the expansion card 1 functions in the first operating mode, which in this first preferred embodiment corresponds to the operating mode according to the PCMCIA standard. Thus, via the expansion card interface 2 the information is transmitted in parallel format.

- 35 The expansion card 1 also comprises a transmitter/receiver unit 15, which is for example a transmitter/receiver applying the GSM standard, and in which for example the modulation/demodulation and channel coding/decoding is conducted, in a way known as such.

The supervision circuit 27 (RESET) of the expansion card maintains the controller 4 of the card in the initial mode when the operating voltage of the card is too low for some reason. Thereby the malfunctions of the controller 4 are prevented *e.g.* during the process of switching on the operating voltages.

The clock circuit 28 of the expansion card generates timing signals necessary for the function of the expansion card 1.

The electronic device 3 according to Fig. 1 comprises for instance a controller 16, which can be for example a microprocessor or a micro controller. The electronic device 3 is also provided with a memory 17, such as random access memory, read-only memory and possibly also writable mass memory. Some of the logical functions necessary for the function of the electronic device are implemented advantageously by means of an application specific logical circuit 18, which is arranged in a data transmission connection *e.g.* with the controller 16 of the electronic device. From the controller 16 and the application specific logical circuit 18, an interface bus 19 is directed to the expansion card interface 2. This interface bus 19 comprises for instance an address bus, a control bus and a data bus. The expansion card interface 2a of the electronic device is typically also provided with bus buffering means 20, which connect the interface bus 19 and the expansion card interface 2a in such a way that possible external interferences cannot easily damage the components of the electronic device 3. In the block diagram of Fig. 1, these bus buffering means 20 are shown in one block for each bus (address, control and data bus), but their more detailed implementation is obvious for anyone skilled in the art.

The electronic device 3 according to Fig. 1 also comprises a keypad 21, by means of which the user can control the function of the electronic device 3. The electronic device 3 can generate different information to be presented in the display device 22 for the user. Furthermore, the electronic device 3 can comprise a speaker 23 and a microphone 24 which are connected by means of an audio block to the controller 16. The speaker 23 and the microphone 24 can be used for example in connection with an audio call, wherein the expansion card 1 does not

necessarily require a speaker and a microphone or a separate audio interface.

5 The clock circuit 29 of the electronic device generates timing signals necessary for the function of the electronic device 3. The operating voltage V_{cc} is produced for example by means of a battery 30, a regulating block 31 and a buffering block 32. By means of the buffering block, possible variations in loading are balanced, and it is also possible to produce several voltages, *e.g.* the actual operating voltage
10 V_{cc} and a programming voltage. The battery is advantageously loaded by means of a charger 33.

Already at the installation stage, application software controlling the function of the expansion card 1 is stored in the electronic device 3.
15 This application software according to a preferred embodiment of the invention comprises for instance a basic module 202 (BM, Fig. 2), a user interface module 203 (UI) and a device driver 205 (DD). The device driver 205 can also be a universal device driver, which is stored in the memory means 17 of the electronic device, advantageously in connection with the installation of the operating system 201.
20

In the following, the function of the method according to the invention will be described with reference to the coupling of Fig. 1 and the arrow diagram of Fig. 2. In connection with the start-up of the electronic device 3, an operating system 201 (OS) such as Windows ®95 is started. The user interface software of the expansion card 1, such as a card-like wireless communication device, can also be started in an operating electronic device 3, for example in connection with the so-called login of the user. In connection with the loading of the operating
25 system 201 (block 206 in the diagram of Fig. 2), device drivers have also been loaded in the program memory of the electronic device 3, the device drivers being used for controlling *e.g.* the keyboard 21, the display device 22, the serial ports (not shown) and the like.
30

35 It is presumed that advantageously in the operating system 201 of the electronic device 3, the start-up of an application programming interface 204 (MPAPI) is also set in connection with the start-up of the

operating system. This application programming interface 204 is for example a mobile phone application.

5 In connection with the start-up of the operating system 201, the basic module 202 according to the invention is advantageously started. This is shown by arrow 207 in the diagram of Fig. 2. This basic module 202 is an application program in which functions necessary for the implementation of the method according to the invention are applied by means of program codes, which functions will be described in more detail hereinbelow. The basic module 202 transmits a message to the application programming interface 204, to notify that it is ready *e.g.* to receive messages indicating the coupling and state changes of the expansion card 1 (arrow 208). The transmission of these messages can be implemented for example with memory means 17 of the electronic device, or with possible signalling mechanisms of the operating system 201 in a way known as such.

Advantageously, when the application programming interface 204 receives the information on the activation of the basic module 202 (arrow 209), the application programming interface 204 loads in this preferred embodiment the device driver 205 of the expansion card 1 in the memory means 17 of the electronic device, and initiates its function. The device driver 205 comprises a program code *e.g.* for controlling the expansion card interface 2, writing data on the data bus, reading the data from the data bus and transmitting the data to the application, such as the application programming interface 204. The start-up of the device driver 205 can also be implemented in such a way that it is loaded and started only after coupling the expansion card 1, wherein the stage 209 is conducted in that connection.

30 After the aforementioned procedures, the function of the operating system continues in a way known as such, and the user can execute operating functions of the electronic device 3. When the expansion card 1 is coupled to the electronic device 3, the coupling can be detected for example in such a way that the expansion card 1 uses card detect lines CD1, CD2 to ground the pins allocated for this purpose in the connector, wherein an interrupt signal is produced to the controller 16 of the electronic device. Thus, the operating system 201 proceeds to

execute a corresponding interrupt service program (block 210), which contains the necessary procedures programmed therein, the procedures including *e.g.* the coupling of the voltages to the expansion card 1 and advantageously the reading of the CIS database or the like of the expansion card. The operating system 201 examines the type of the expansion card 1 coupled to the electronic device 3 *e.g.* from said CIS database. The CIS database advantageously contains information on the type, version and manufacturer of the card, wherein on the basis of this information the operating system 201 is capable of determining the expansion card 1 in question. Thereafter the operating system 201 informs the device driver 205 which is intended to control the expansion card, that the card is coupled to the electronic device 3 (arrow 211).

The device driver 205 also executes the initialization of the function of the expansion card 1, *i.e.* for example the setup of the operating parameters necessary for the use of the expansion card (block 212). Furthermore, at this stage, a data transmission connection is advantageously established between the expansion card 1 and the data processor 3 via the expansion card interface 2.

In the expansion card the controller 4 and the digital signal processing unit 6 conduct initialization procedures *e.g.* to set the operating parameters of the expansion card, which is known as such. When the initialization procedures have been executed, information indicating whether the expansion card is ready to operate is transmitted to the electronic device 3 advantageously in such a way that the controller 4 of the expansion card produces a "clear to send" message CTS by means of the state change (0/1) of CTS line in the asynchronous serial interface block 8 of the digital signal processing unit. This CTS line is not shown separately in the appended figures, but it is implemented in a way known as such advantageously in the first serial bus 11. The control block 26 of the bus adapter detects the change in the state of this CTS line and produces an interrupt request to the electronic device 3 via the extension card interface 2. The controller 16 of the electronic device detects the interrupt request and proceeds to execute the device driver 205 again, wherein the device driver 205 knows that the expansion card is ready to operate and capable of receiving commands. The device driver 205 transmits information on the setting

of the operating mode of the expansion card 1 advantageously also to the application programming interface 204.

5 If an error occurs in the start-up of the expansion card 1, the controller 4 of the expansion card produces an error message thereof as well, which error message is transmitted to the electronic device 3. Thus, the device driver 205 transmits an error message advantageously to the basic module 202, in which the error message is examined. The error message can be presented to the user by producing a message
10 corresponding to the error in text and/or graphic format in the display 22 and/or an audio message in the speaker 23. In this method, the error messages can be easily modified according to different language versions, and thus the user can select the desired language for example at the installation stage of the software.

15 Correspondingly, the device driver 205 transmits information to the application programming interface 204 (arrow 213). The application programming interface 204 transmits information on the coupling of the expansion card 1 further to the basic module 202 (arrow 214), which
20 has already been loaded and started by the operating system 201. The basic module 202 receives the information on the coupling of the expansion card 2 to the electronic device and initiates the loading and start-up of the user interface module 203 of the coupled expansion card (arrow 215).

25 To load the user interface module 203, the basic module 202 conducts program commands by means of which a message indicating the loading of a particular program module is advantageously transmitted to the operating system 201. This program module is named in a manner
30 which is recognized by the operating system 201, and stored at the installation stage *e.g.* in the memory means 17 of the electronic device 3. The loading of the program module is conducted for example in such a way that the operating system 201 copies the program module in the memory means from the permanent memory, such as ROM, to the data
35 memory, such as RAM, and stores in its registers information on the starting address of the loaded program module. This starting address can be notified to the basic module 202, wherein the basic module 202 can directly control the function of the user interface module 203.

Another alternative for implementing the mutual function of the basic module 202 and the user interface module 203 is that the modules 202, 203 communicate by means of message transmission modules of the operating system 201. It is obvious that in practical applications these loading and start-up stages can be implemented in another known manner, and the present invention is not restricted solely to the facts presented in this description.

After said loading and start-up procedures the user can utilize the user interface module 203 to control the function of the expansion card 1. In a way known as such, the user interface module 203 has advantageously produced a program window in the display 22 of the electronic device 3 to present the information. The program window can also contain input fields in which the user can input information by means of the keyboard 21 of the electronic device, or possibly also by means of audio commands via the microphone 24. For audio control the electronic device 3 is provided with means (not shown) for converting the audio commands into text format, or other suitable format that can be understood by the operating system. In the program window there may also be selection fields, *e.g.* for handset key functions, data call, speech call, fax-transmission, etc. Furthermore, this program window advantageously displays information on the operating mode of the expansion card and on the possible faults in the expansion card 1. It is obvious that the telephone application program mentioned herein is merely an example of the application programs suitable for operating the expansion card 1, but the invention can also be applied in other types of expansion cards and application programs.

If necessary, the user can enter his/her own identification code by means of which the access right of the expansion card can be confirmed. After entering the identification code the user can *e.g.* start call setup, answer incoming calls, change the settings of the expansion card 1, such as the data transfer rate, identification code, etc.

If an error occurs in the loading of the user interface module 203, the basic module 202 can notify the user of this error in the display 22 and/or the speaker of the electronic device. Since the basic module 202 according to the preferred embodiment of the invention is also

implemented as a program module functioning under the operating system, it is easy to modify the messages of the basic module according to the different language versions without a need to interfere with the structure of the program as such. The texts of the different language versions are thus implemented e.g. in separate files, of which the desired language version is stored in the memory means 17 for example at the installation stage. If the free storage capacity is sufficient in the memory means 17 of the electronic device 3, it is possible to store the texts of different language versions in the memory means 17, and the desired language version is taken in use only when starting the program.

The detachment of the expansion card 1 from the electronic device 3 can be correspondingly detected from the state changes in the identification lines of the card. This situation also advantageously produces an interrupt request to the controller 16 of the electronic device, in which an interrupt service program is executed. Thus, information on the detachment of the expansion card 1 is transmitted to the device driver 205 which transmits the information to the application programming interface 204. The application programming interface 204 informs the basic module 202 and the user interface module 203. Thereafter the user interface module 203 is halted for example in such a way that the user interface module 203 stops itself. Thus, memory is deallocated in the memory means 17 of the electronic device 3 for the use of other applications. However, preferably at least the basic module 202 and advantageously also the application programming interface 204 and the device driver 205 continue their operation. The basic module 202 remains in the memory after being started until the operating system is halted either to turn off the electronic device 3 or to restart the operating system, or until the user logs out of the operating system.

After the detachment the expansion card 1 can be coupled to the electronic device again. Also in this situation the loading of the user interface module 203 by means of the method according to the invention is possible when the basic module is operating. The process is substantially similar to the above example illustrating the coupling of the expansion card, and reference is made thereto in this context.

It is possible that there is a user profile function available in the operating system 201, by means of which different users can define individual settings for the operating system 201. The user can define the application programs to be started when the user in question logs in to the operating system. Thus, the operating system 201 starts these applications. In the present invention, the start-up of the basic module 202 is not, however, dependent on the user profile functions. The basic module 202 is preferably started in connection with the login to the operating system 201. If the expansion card is coupled to the electronic device 3 before the basic module is started, the following steps will be taken in the method according to the preferred embodiment of the invention.

The operating system has informed the device driver 205 of the coupling of the expansion card 1. The application programming interface 204 has loaded the device driver 205 which has initialized the function of the expansion card 1 and informed the application programming interface 204 that it is ready for operation. When the basic module 202 is started it asks the application programming interface 204 to inform whether the expansion card 1 is ready to operate. Thus the basic module 202 loads and starts the user interface module 203, as disclosed earlier in this description.

Yet another example of the way in which the electronic device 3 and the expansion card 1 are capable of communicating with each other via the expansion card interface 2, will be described in the following. The expansion card 1 is set to function *e.g.* as an interface card (I/O). For example the PCMCIA standard describes in more detail the requirements of different card types (I/O card and memory card) in expansion cards according to PCMCIA standard *e.g.* with respect to the register structure and the contact pins. Shortly it is stated in this context that determined memory areas and interface areas can be addressed by the controllers 4, 16. The memory area is typically much larger in size (even several megabytes) than the interface area (couple of hundred bytes or kilobytes). Separate control lines (*e.g.* read and write lines RD, WR) are arranged for processing the memory area, and correspondingly, separate control lines (*e.g.* read and write lines IORD,

IOWR), are arranged for processing the interface area. The area to be processed is addressed by the address lines of the address bus, there being *e.g.* 32 address lines for addressing the memory area, and some of them (8/16) are used to address the interface area. The control lines are used to determine in more detail the area which is being processed and, on the other hand, whether the controller is reading or writing information. The data bus is used for reading and writing information.

The asynchronous transmitter/receiver block 13 and the synchronous transmitter/receiver block 14 is specified in different physical addresses within the interface area. In memory cards the address area is preferably a memory area. The address area is *e.g.* 256 bytes, wherein eight address lines (A0...A7) are required to indicate their addresses. The controller 16 of the electronic device sets the desired device address in the address bus of the interface bus 19. Thereafter in the control bus, the state of the read line (IORD) is set in the state in which information is transmitted from the expansion card 1 to the data bus of the expansion card interface 2. Typically, reversed logic is used, *i.e.* when the read line is in the logical 1 state, data is not written in the data bus, and correspondingly, in the logical 0 state writing is allowed. Writing on the expansion card 1 via the expansion card interface 2 is advantageously conducted in such a way that the controller 16 sets the information of the interface bus 19 to be written in the data bus, the address corresponding to the transmitter/receiver block 13, 14 to which the information is intended to be written to the address bus, and thereafter the state of the write line (IOWR) in the control bus of the interface bus 19 is set into the logical value corresponding to the write enable state, *e.g.* the logical 0 state. Thus the expansion card 1 is used to transmit the information located in the data bus of the expansion card interface to a buffer (not shown), from which the information can be converted into serial format and transmitted to the serial bus 11, 12 depending on that whether the information was written into the asynchronous transmitter/receiver block 13 or into the synchronous transmitter/receiver block 14.

By means of the arrangement according to Fig. 1, it is possible to transmit messages between the electronic device 3 and the expansion card 1. This example is also illustrated in the appended Fig. 3. The

figure shows information transfer in a layer structure, which advantageously comprises at least an application layer (layer 7), a link layer (layer 2) and a physical layer (layer 1). The user interface module 203 transmits commands (*e.g.* selection of a telephone number), parameters (*e.g.* telephone number), etc. to the application programming interface 204. The application programming interface 204 transmits the messages to the device driver 205, from which they are transmitted via the expansion card interface 2 to the expansion card 1 (block 301). In the expansion card 1 the messages are transmitted on the asynchronous serial bus 11 to the asynchronous serial interface block 8 of the digital signal processing unit. The digital signal processing unit 6 transmits the messages to the controller 4 to be processed. Advantageously the messages that arrive from the processing software 302 of the asynchronous bus interface of the controller 4, are transmitted further *e.g.* to the application program 303 of the controller 4, in which they are examined. Information to the opposite direction functions similarly to the above description, but naturally in the opposite order.

The operating system 201 of the electronic device 3 comprises data structures or the like, by means of which the operating system 201 maintains the resources required by the active application programs, *e.g.* memory, interfaces, device drivers and message transmission, which is prior art known by anyone skilled in the art and thus need not be discussed in more detail in this context.

The present invention is not restricted solely to the embodiments presented above, but it can be modified within the scope of the appended claims.

Claims:

1. A method for loading the user interface software (202, 203) of an expansion card in an electronic device (3) comprising means (16, 17) for loading, starting and executing program modules in the electronic device (3), which expansion card (1) can be coupled in a releasable manner to the electronic device (3), **characterized** in that the user interface software (202, 203) is divided at least into a basic module (202) and a user interface module (203), that the loading of the user interface software (202, 203) is executed in at least two phases, wherein in the first phase the loading and start-up of the basic module (202) is conducted, and in the second phase the loading and start-up of the user interface module is conducted, and that the second phase is conducted when the expansion card (1) is coupled to the electronic device (3).
2. The method according to claim 1, **characterized** in that said basic module (202) of the user interface software controls the execution of the second phase.
3. The method according to claim 2, **characterized** in that in the electronic device (3) a application programming interface (204) and a device driver (205) are executed in order to arrange communication between the user interface software (202, 203) and the expansion card, wherein when the expansion card (1) is coupled to the electronic device (3), information on the coupling of the expansion card (1) is transmitted from the device driver (205) to the application programming interface (204) from which the information is transmitted to the basic module (202), wherein the loading and start-up of the user interface module is initiated from the basic module.
4. The method according to claim 3, **characterized** in that in the electronic device (3) an operating system (201) is executed to control the function of the electronic device, that in the coupling of the expansion card (1) an interrupt signal is produced, wherein in the operating system the possible cause for the interrupt signal is examined and information on the coupling of the expansion card is transmitted to the device driver (205).

5. Method according to any of the claims 1 to 4, **characterized** in that when the expansion card (1) is detached from the electronic device (3), the user interface module (203) is halted and the basic module (202) is kept in operation.

6. The method according to claim 5, **characterized** in that when the user interface module (203) is being loaded, an area in the memory (17) is allocated for the user interface module, and that when the expansion card (1) is detached from the electronic device (3), the area allocated in the memory (17) for the user interface module (203) is deallocated.

7. An electronic device (1) comprising means (16, 17) for loading user interface software (202, 203) in an electronic device (3), means (2a, 20) for coupling the expansion card in a releasable manner in the electronic device (3) and means (16, 17) for loading, starting and executing program modules in the electronic device (3), **characterized** in that the user interface software (202, 203) is divided at least into a basic module (202) and a user interface module (203), that the means (16, 17) for loading the user interface software (202, 203) comprise means for loading and starting the basic module and means for loading and starting the user interface module (203), and that the loading of the user interface module (203) is arranged to be executed when the expansion card (1) is coupled to the electronic device (3).

8. The electronic device (3) according to claim 7, **characterized** in that said basic module (202) of the user interface software comprises means for controlling the execution of the second phase.

9. The electronic device according to claim 8, **characterized** in that the electronic device (3) comprises means for executing the device driver (205) to arrange communication between the user interface software (202, 203) and the expansion card, means for recognizing the coupling of the expansion card (1) to the electronic device (3) and means for transmitting (213) the information on the coupling of the expansion card (1) from the device driver (205) to the basic module (202), wherein the

basic module comprises means for loading and starting the user interface module (203).

5 10. The electronic device (3) according to claim 9, **characterized** in that the electronic device (3) comprises means for executing an application programming interface (204), and means for transmitting (213) information on the coupling comprise an application programming interface (204).

10 11. The electronic device (3) according to claim 10, **characterized** in that the electronic device (3) comprises means for executing an operating system to control the function of the electronic device, means for producing an interrupt signal on the coupling of the expansion card (1) to the electronic device (3), wherein the operating system comprises
15 means for examining the cause of said interrupt signal and means for transmitting information on the coupling to the device driver (205).

20 12. The electronic device (3) according to any of the claims 7 to 11, **characterized** in that the expansion card (1) comprises a transmitter/receiver unit (15) and a high frequency power amplifier (9) of the wireless communication device.

25 13. The electronic device (3) according to any of the claims 7 to 11, **characterized** in that it is a data processor.

30 14. A storing means for loading the user interface software (202, 203) of an expansion card in an electronic device (3) comprising means (16, 17) for loading, starting and executing program modules in the electronic device (3), which expansion card (1) can be coupled in a releasable manner to the electronic device (3), **characterized** in that
35 the user interface software (202, 203) is divided at least into a basic module (202) and a user interface module (203), and that the loading program comprises procedures for loading the user interface software (202, 203) in at least two phases, wherein in the first phase the loading and start-up of the basic module (202) is arranged to be conducted, and in the second phase the loading and start-up of the user interface module is arranged to be conducted, and the second phase is

conducted when the expansion card (1) is coupled to the electronic device (3).

Abstract:

The invention relates to a method for loading the user interface software (202, 203) of an expansion card in an electronic device (3). The electronic device (3) comprises means (16, 17) for loading, starting and executing program modules in the electronic device (3). The expansion card (1) can be coupled in a releasable manner to the electronic device (3). The user interface software (202, 203) is divided at least into a basic module (202) and a user interface module (203). The loading of the user interface software (202, 203) is executed at least in two phases, wherein in the first phase the loading and start-up of the basic module (202) is conducted, and in the second phase the loading and start-up of the user interface module is conducted. The second phase is conducted when the expansion card (1) is coupled to the electronic device (3).

The invention also relates to an electronic device (3) and a storing means.

Fig. 2

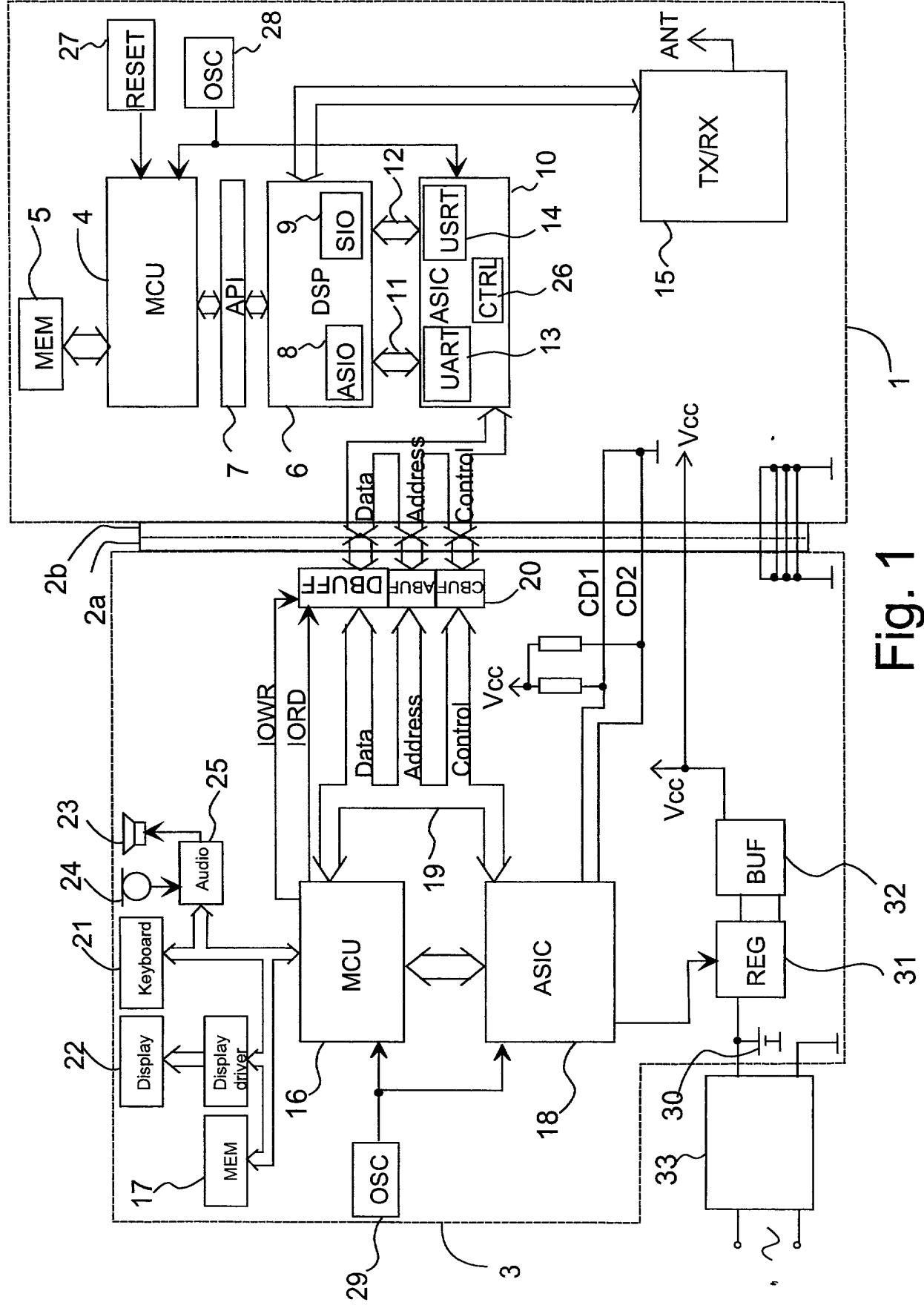


Fig. 1

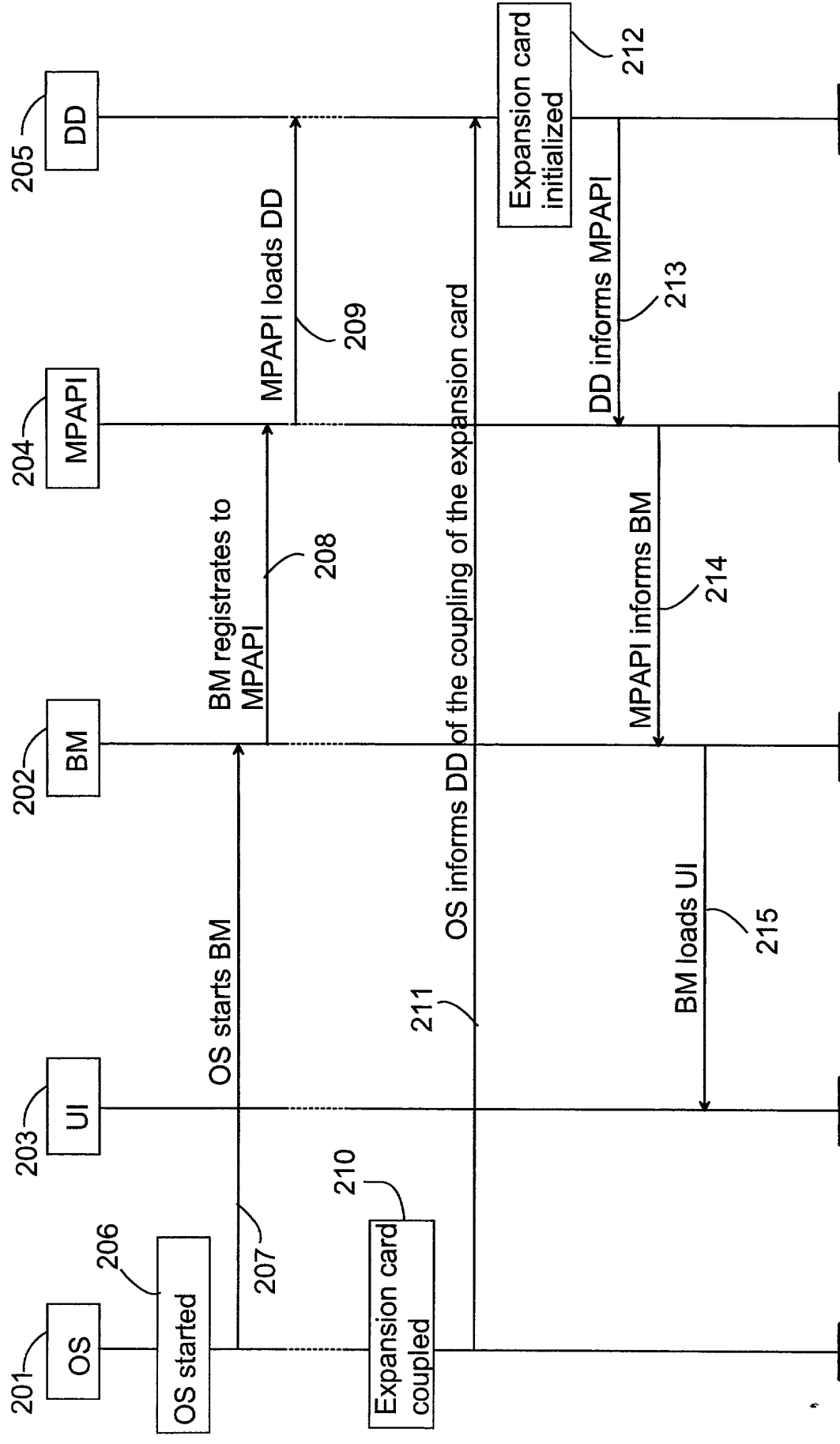


Fig. 2

COMBINED DECLARATION AND POWER OF ATTORNEY

(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL,
DIVISIONAL, CONTINUATION OR C-I-P)

As a below named inventor, I hereby declare that:

TYPE OF DECLARATION

This declaration is of the following type:

(check one applicable item below)

☒ original.

☐ design.

☐ supplemental.

NOTE: *If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items.*

☐ national stage of PCT.

NOTE: *If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR C-I-P.*

☐ divisional.

☐ continuation.

☐ continuation-in-part (C-I-P).

INVENTORSHIP IDENTIFICATION

WARNING: *If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.*

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor (*if only one name is listed below*) or an original, first and joint inventor (*if plural names are listed below*) of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

TITLE OF INVENTION

Method for loading user interface software

SPECIFICATION IDENTIFICATION

the specification of which:

(complete (a), (b), or (c))

(a) ☒ is attached hereto

(b) ☐ was filed on _____ as ☐ Serial No. 0/ _____
or ☐ Express Mail No., As Serial No. not yet known _____
and was amended on _____ (if applicable).

NOTE: Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 CFR 1.67.

(c) ☐ was described and claimed in PCT International Application No. _____, filed on _____ and as amended under PCT Article 19 on _____ (if any).

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

(also check the following items, if desired)

- ☒ and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and
- ☐ in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.98.

PRIORITY CLAIM (35 U.S.C § 119(a)-(d))

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (e))

(d) ☐ no such applications have been filed.

(e) ☒ such applications have been filed as follows.

NOTE: where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

**PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)–(d)**

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119
Finland	991167	24 May 1999	<input checked="" type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>
			<input type="checkbox"/> YES NO <input type="checkbox"/>

**CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)
(34 U.S.C. § 119(e))**

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER

FILING DATE

_____ / _____ _____ / _____ _____ / _____ _____ / _____	_____ _____ _____ _____
--	----------------------------------

**CLAIM FOR BENEFIT OF EARLIER US/PCT APPLICATION(S)
UNDER 35 U.S.C. 120**

- ☐ The claim for the benefit of any such applications are set forth in the attached
ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY
FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART (C-I-P)
APPLICATION

**ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

NOTE: *If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.*

POWER OF ATTORNEY

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

(list name and registration number)

Clarence A. Green	(24,622)
Harry F. Smith	(32,493)
Mark F. Harrington	(31,686)

(check the following item, if applicable)

☐ Attached, as part of this declaration and power of attorney, is the authorization of the above-named attorney(s) to accept and follow instructions from my representative(s).

SEND CORRESPONDENCE TO

Clarence A. Green
Perman & Green, LLP
425 Post Road
Fairfield, CT 06430

DIRECT TELEPHONE CALLS TO:

(Name and telephone number)

Clarence A. Green
(203) 250-1800

DECLARATION


I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.


Full name of sole or first inventor

Jouni _____ Rapakko _____
(GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)

Inventor's signature  _____
Date April 12, 2000 Country of Citizenship Finland
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Full name of second joint inventor, if any

Sami _____ Pajusaari _____
(GIVEN NAME) (MIDDLE INITIAL OR NAME) FAMILY (OR LAST NAME)

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Date April 12, 2000 Country of Citizenship Finland
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Post Office Address Kaiturinkatu 16 D 32, FIN-33820 Tampere, Finland

Full name of third joint inventor, if any

(GIVEN NAME) MIDDLE INITIAL OR NAME FAMILY (OR LAST NAME)

Inventor's signature _____
Date _____ Country of Citizenship _____
Residence _____
Post Office Address _____

(check proper box(es) for any of the following added page(s)
that form a part of this declaration)

☐ **Signature** for fourth and subsequent joint inventors. *Number of pages added* _____

* * *

☐ **Signature** by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. *Number of pages added* _____

* * *

☐ **Signature** for inventor who refuses to sign or cannot be reached by person authorized under 37 CFR 1.47. *Number of pages added* _____

* * *

☐ Added page for **signature** by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 CFR 1.47)

* * *

☐ Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.

☐ Number of pages added _____

* * *

☐ Authorization of attorney(s) to accept and follow instructions from representative.

* * *

(if no further pages form a part of this Declaration,
then end this Declaration with this page and check the following item)

☒ This declaration ends with this page.